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ABSTRACT

This study tested the hypothesis that the academic development services offered by the University of California (UC) through the Early Academic Outreach Program (EAOP) result in more students completing the UC preparatory coursework, the first hurdle to being eligible to apply and be admitted to UC. The study analyzed the course-taking behavior of two cohorts of high school students in a large urban school district in California. It analyzed their student level district data from grades 7 through 12, data that included student demographics, language information, course-taking behavior, and course grades from 1994-1995 to 1999-2000. The study used the availability of EAOP at a school to correct for endogeneity of participation in these programs. This technique, known as differences in statistics, statistically separated the effect of participation in EAOP on students' subsequent completion of the UC preparatory coursework from the effects of other characteristics of the student or the school. The results, which were definitive, suggest that students who participate in EAOP throughout high school are twice as likely to complete the UC preparatory coursework by the end of 12th grade than were nonparticipants. Two appendixes describe student characteristics and achievement and the means and standard deviations for study variables. (Author/SLD)

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CSE Tech Report 589

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THE EARLY ACADEMIC OUTREACH PROGRAM (EAOP) AND ITS IMPACT ON HIGH SCHOOL STUDENTS' COMPLETION OF THE UNIVERSITY OF CALIFORNIA'S PREPARATORY COURSEWORK

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Abstract

Providing academic development services to high school students is intended to improve a student's skills and in turn assist them in completing the UC preparatory coursework, which is the first step in achieving UC eligibility, enrolling in college and completing a four-year degree. This report tests the hypothesis that the academic development services offered by the University of California in a program entitled, the Early Academic Outreach Program, result in more students completing the UC preparatory coursework, the first hurdle to being eligible for applying and being admitted to the University of California. We analyzed the course-taking behavior of two cohorts of high school students in a large urban school district in California. We analyzed their student level district data from their 7th through 12th grade years, which included student demographics, language information, course-taking behavior and course grades, spanning 1994/'95 to 1999/2000. This report uses the availability of EAOP at a school to correct for the endogeneity of participation in these programs. This technique, known as difference in differences, statistically separates the effect of participation in EAOP on students' subsequent completion of the UC preparatory coursework from the effects of other characteristics of the student or the school. Our results are definitive, and suggest that students who participate in EAOP throughout high school are twice as likely to complete the UC preparatory coursework by the end of 12th grade than do non-participants of EAOP.

I. Introduction

Policymakers and educators are committed to increasing the competitive eligibility of high school students applying to the University of California (UC) and to increasing the representation of economically disadvantaged and underrepresented students on UC campuses. Toward this aim, policymakers, in conjunction with the University of California, have invested substantial resources toward these common goals. An element of the University of California's strategy to accomplish these goals is to provide academic development student programs, such as Early Academic Outreach (EAOP), to 10th, 11th, and 12th graders. Providing academic development services to high school students is intended to improve a

student's skills and in turn assist them in completing the UC preparatory coursework, which is the first step in achieving UC eligibility, enrolling in college and completing a four-year degree. Increasing UC eligibility via increasing the number of students who complete UC preparatory coursework is both a key programmatic strategy and a primary goal of these programs.

As a result, the University California Office of the President (UCOP) has funded a number of research and evaluation efforts to investigate and evaluate the effects of their outreach efforts and these programs on the completion of the UC preparatory coursework. This report in particular, investigates the research question of whether EAOP participants are more or less able to complete the UC college prep curriculum than non-participants. It tests the hypothesis that the academic development services offered by the University of California's Early Academic Outreach Program (EAOP) result in more students completing the UC preparatory coursework, the first hurdle to being eligible to apply for and being admitted to the University of California. Using student-level data from a collaboration with a large urban school district in California, this report analyzes the course-taking behavior of high school students from 7th to 12th grade and their completion of the UC preparatory coursework.

Understanding whether UC academic development programs of this sort impact the completion of UC preparatory coursework provides a gauge for the importance of academic support services to students during high school and suggests that supplementing and enhancing classroom instruction and bridging the gap between high school and college curricula improves students' skills as well as their chances of being eligible to the University of California immediately out of high school.

Organization of the Report

This report briefly summarizes the history and goals of EAOP and discusses how EAOP could impact a student's completion of UC's college preparatory coursework; lays out the empirical strategy for statistically separating the impact of participation from the other characteristics of the student and their school, which influence both participation and behavior; presents the results of our analyses; and finally concludes that EAOP has significant impact on high school students' ability to complete the UC college preparatory coursework by the end of 12th grade across both cohort years examined.

Additionally, this report complements the current evaluation(s) of the Educational Outreach and K-12 Improvement Programs and aims to increase the state's, districts', and schools' understanding of how students maneuver within California high schools serving large numbers of educationally disadvantaged students and complete the required courses to achieve eligibility for applying to a UC university. It also addresses students' progression through California's public education system with attention to the role of outreach.

II. EAOP Program Description

For many years, the University has been actively involved in providing academic enrichment programs that bridge secondary and post-secondary education. These programs have developed on each of the 10 University of California campuses and within the Office of the President, which serves as the administrative center of the University system. EAOP is designed to support academic enrichment and informational access for students interested in higher education. EAOP programs range from early grades through high school, and are generally targeted toward educationally disadvantaged students. Specifically, EAOP provides students with college preparation information and support; intensive academic enrichment opportunities; and promotes high academic achievement. EAOP academic development services do not replicate or replace sustained academic preparation in middle and high school. Rather, EAOP supplements and enhances classroom instruction and bridges the gap between high school and college curriculum in an effort to help students improve skills, complete the UC preparatory coursework, and in turn achieve UC eligibility, enroll in college and complete a four-year degree.

EAOP's vision looks *beyond* UC eligibility and admission and is based on the following principles. First, the most complex and important variable that enables students to complete a four-year college degree is the academic intensity and quality of their high school curriculum. Second, opportunity to learn makes the greatest difference in long-term degree completion. And third, continued, progressive, and increasingly advanced preparation will enable students to succeed in challenging courses and reach their degree goals.

The following are EAOP's three central program components.

1. *Preparation services* are instructional and informational activities that prepare students to undertake rigorous honors and Advanced Placement coursework. By providing information on such courses and by teaching basic skills, preparation services reinforce concepts that students learn in their weekday classrooms. Test preparation services that emphasize pre-SAT I and ACT preparation and provide testing practice are an important component of these services. Students in EAOP's preparation services are generally in the middle and early high school grades and demonstrate varying levels of academic skill.

2. *Achievement services* are instructional activities that emphasize mastery of the academic concepts presented in advanced classes, such as honors and Advanced Placement courses. Achievement services help students develop skills necessary to succeed in advanced classes and prepare for the research opportunities available in EAOP's Enrichment Services and in college. Such activities use a combination of high school- and college-level curriculum and are designed for students who do not require remedial or basic instruction in mathematics or English. Achievement services are intensive, generally take place over several weeks (or are residential at least one week), and require a significant investment of students' out of class time. Intensive SAT I/ACT and SAT II test preparation services are a part of this category, as a certain amount of proficiency in math and English is required in order for test preparation to be effective. These services are targeted primarily at 10th- and 11th-grade students who have demonstrated achievement in, or potential to enroll in, honors and Advanced Placement courses.

3.*Enrichment services* are instructional activities that engage students in the intellectual life of the university through study and research opportunities with advanced graduate students and faculty. Such services are intensive and discipline-based, and provide sustained intellectual engagement over a significant period of time. Enrichment services provide academic experiences that surpass those available through traditional high school curriculum. In cases where these opportunities correspond to a college or university's courses, a student may earn academic credit by participating in these activities. Students enrolled in such programs have mastered basic skills and concepts, participate in Advanced Placement classes, and have expressed an intellectual interest in a particular subject area. Enrichment services may stand alone or may be combined with Achievement Services offered at a campus (i.e., specialized classes offered under the auspices of another EAOP service). More information can be found on the Web at www.eaop.org.

In sum, EAOP aims to increase students' awareness of what it takes to be eligible for the University of California, improve their skills, as well as influence their choices about what type of courses they need to complete before the end of 12th grade.

III. Empirical Strategy and Data

Schools, districts, principals, students, researchers, and practitioners understand the importance of completing the UC preparatory coursework in achieving UC eligibility. However, programs have not been evaluated on their ability to achieve this goal. A-G completion has not been used as an outcome on which to evaluate success of academic development programs because students participating in the programs are systematically different than the students who do not participate in the programs. There are selection criteria for entrance into the program that induce selection bias into a simple assessment of outcomes of participants vs. non-participants. The purpose of this report is to test the hypothesis that the academic development services of the Early Academic Outreach Program result in more students completing the UC preparatory coursework, by using the availability of EAOP at a school to correct for the endogeneity of participation in these programs. This technique, known as difference in differences (Meyer, 1995), statistically separates the effect of participation in EAOP on students' subsequent completion of the UC preparatory coursework from the effects of other characteristics of the student or the school. It is explained in detail in the next section.

Measuring A-G Eligibility

Completion of the A-G course requirements is a necessary but not sufficient condition for admission. The application and acceptance process to the UC system requires a series of steps. A student must first and foremost complete the required college preparatory A-G course sequence. Then the student must take the SAT I and the SAT II. The student must meet the UC eligibility criteria, based on both the SAT scores and the student's grade point average in the required A-G college preparatory course sequence. The student must apply to a campus and also be admitted to that campus. Each of these steps progressively winnows students into the eligibility pool, the applicant pool, and finally the admission pool. Refer to the California Postsecondary Education Commission (CPEC) 1990 eligibility study for how many students are not eligible because of failing to complete the A-G requirements, even though many students may be close to A-G completion.

Completion of the A-G course sequence however is the most complicated hurdle for most students advancing from high school to college. It is also a very important indicator of how effective schools are at preparing students for college

across all subject areas. The "A-G requirements"[1] include 15 units of high school courses, seven units of which must be taken in the last two years of high school. (A unit is equal to one academic year or two semesters of study).[2]

The 15 units of high school college prep coursework are as follows:

- A: History/Social Science—2 years required.

  Two years of history/social science including one year of U.S. history or one half year of U.S. history AND one half year of civics or American government; and one year of world history, cultures, and geography.

- B: English—4 years required.

  Four years of college preparatory English that include frequent and regular writing and reading of classic and modern literature. Not more than two semesters of ninth-grade English can be used to meet this requirement.

- C: Mathematics—3 years required, 4 recommended.

  Three years of college preparatory mathematics that include the topics covered in elementary and advanced algebra and two- and three-dimensional geometry. Approved integrated math courses may be used to fulfill part or all of this requirement, as may math courses taken in the seventh and eighth grades that the high school accepts as equivalent to its own math courses.

- D: Laboratory Science—2 years required, 3 recommended.

  Two years of laboratory science providing fundamental knowledge in at least two of these three disciplines: biology (which includes anatomy, physiology, marine biology, aquatic biology, etc.), chemistry, and physics. Laboratory courses in earth/space sciences are acceptable if they have as

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[1] Beginning with applicants who are in the fall 2003 entering class, the subject A-F requirements will be known as the A-G requirements. They will then include one unit of coursework in visual and performing arts (dance, drama/theater, music or visual arts). The number of college preparatory electives required will be reduced from two units to one, so that the total number of subject requirements will remain at 15. Also the visual and performing arts requirement will be labeled the "F" requirement, and the college preparatory elective requirement will be labeled the "G" requirement. The college preparatory required sequence will then be known as the A-G requirements instead of the A-F requirements. This report will use the term "A-G requirements"; however, the analyses of the students' course-taking patterns using the 1996/'97 and 1997/'98 ninth-grade cohorts are conducted using the "old" A-F requirements, not the new A-G requirements, as these are the requirements that pertain to their eligibility.

[2] To be accepted by the university, the courses taken to satisfy the A-G requirements must appear on the school's official University of California certified course list. Courses must be listed on students' transcripts as they appear on the certified course list. The course lists for all high schools in California can be found at www.ucop.edu/pathways/infoctr/doorway_index.html#a-f

prerequisites, or provide basic knowledge in, biology, chemistry, or physics. The appropriate 2 years of an approved integrated science program may be used to fulfill this requirement. Not more than one year of ninth-grade laboratory science can be used to meet this requirement.

- E: Language other than English—2 years required, 3 years recommended.

  Two years of the same language other than English. Courses should emphasize speaking and understanding, and include instruction in grammar, vocabulary, reading, and composition. Courses in language other than English taken in the seventh and eighth grades may be used to fulfill this part of the requirement if the high school accepts them as equivalent to its own courses.

- F: Visual and performing arts—1 year required.

  One year of dance, drama/theater, music or visual arts is acceptable.

- G: College Preparatory Electives—1 year required.

  One year (two semesters), in addition to those required in the "A-F" categories above, chosen from the following areas: visual and performing arts, history, social science, English, advanced mathematics, laboratory science, and language other than English (a third year in the language used for the "E" requirement or 2 years of another language).

In addition to taking and completing the requisite A-G courses with a grade of at least a C, to be eligible a student must attain a certain grade point average in the A-G subjects that is determined on a sliding scale based on the student's scores on the SAT I (or the ACT) and the SAT II. For example, students with A-G GPAs of at least 3.29 are UC eligible as long as their combined test score on the SAT I and SAT II is at least 3320, whereas students with A-G GPAs of 3.0 are required to have a combined test score of at least 3840. In calculating the A-G GPAs, the university also assigns extra points for up to four units of university certified honors level and Advanced Placement courses taken in the last three years of high school. No more than two years of UC-approved honors level courses taken in the 10th grade may be given extra points. A grade of a D in an honors or Advanced Placement course does not earn extra points. The combined test score total equals: (SAT I composite score) + (2 x [SAT II Writing Score + SAT II Mathematics score + third required SAT II score]). The SAT I composite is the highest combined mathematics and verbal score

from a single sitting. Highest individual SAT II scores, from any sitting, are considered.

Also to be UC eligible, a student must take the three SAT II tests including writing, mathematics Level 1 or 2, and one test in one of the following areas: English literature, foreign language, science, or social studies. However, students are not required to attain specific scores on these tests; they are only required to take them. (The SAT I is the basic verbal and mathematics tests; the SAT II is the optional subject matter tests.) Refer to the following Web site for details and a further explanation of these eligibility and admissions criteria: www.ucop.edu/pathways/impinfo/freshx.html

Overall, A-G completion, or as referred to in this report A-G eligibility, is a basic eligibility requirement that is necessary but not sufficient for UC eligibility. Doing well and receiving high grades in the A-G courses is also essential because UC eligibility is dependent on the combination of a student's A-G course grade point average and the student's SAT scores.

Calculating A-G Completion

To investigate A-G completion, we analyzed two cohorts of ninth-grade students during their 7th- through 12th-grade years—one cohort of ninth graders in 1995/'96 and one cohort in 1996/'97. Analyzing two cohorts of data allowed us to investigate the stability of our findings and conclusions. We report the data as pooled data; however, the analyses for the individual years (1995/'96 and 1996/'97) illustrate the same conclusions as the pooled data, thus confirming our findings.

The district generously made available these student-level data for the 1995/'96 and 1996/'97 cohorts of ninth graders with data covering student demographics (free/reduced lunch status, ethnicity, gender, etc.); language information (bilingual, English only, currently LEP, previously LEP); and course-taking behavior and course grades from 7th, 8th, ninth, 10th, 11th, and 12th grades. These analyses required student-level district data from 1994/'95 until 1999/2000. The student-level identification of EAOP participation by name, gender, grade level, year, and school was obtained from program participation records from EAOP and UCOP. The district collaborated with us to link the specific individual names with their district IDs, and provided us with a way to identify each student in the district-level database.

Using this individual student-level data on each student, cohort files were built and course-taking event histories by semester were constructed for each student. With the data constructed in this manner, we calculated our outcome variable: A-G completion. We calculated whether students were A-G eligible or competitively A-G eligible. A-G eligibility is based on a student completing the 15 units in the required UC-approved A-G course requirements by the end of 12th grade, of which seven units must be taken in the last 2 years of high school. To calculate these outcome measures, we need to know which courses were considered "UC-approved courses" and for which requirement they were approved. We learned through conversations with the district, UCOP, and the schools that there are lots of details concerning what constitutes a "UC-approved course" for the different A-G requirements. For example, if Biology 1A and 1B do not have the 40 hours of lab time required by UC to have it approved as a D requirement, then Biology 1A and 1B can only be approved as a D requirement if a student has also completed both semesters of Algebra IA and IB (or its equivalent) as a prerequisite to Biology 1A. We sought out the array of details and clarifications by course number in our discussions with UCOP and district staff to make sure that we could include these specific nuances and differences as part of the code for calculating A-G eligibility.

Empirical Framework

Generally, the impact of participating in an activity—in this case the effect of participating in EAOP activities—*cannot* be measured by comparing the outcomes of those who choose to participate in the activity against the outcomes of those who do not participate. There may be characteristics that are related to both choosing to participate in the given activity and to the outcomes of interest; this is known as a self-selection problem. To address this self-selection problem and be able to examine the impact of participating in EAOP on students' A-G completion, this report compares students with a high probability of participation in EAOP to similar students at schools that did not offer EAOP. This approach measures the impact of participation because it takes into account the student and school characteristics of students who have similar characteristics to participants in EAOP, *but* did not participate because their schools did not offer it.

To measure the impact of participation, we first estimated the likelihood of participating in EAOP for those individuals at schools offering these activities. This estimation identified those characteristics associated with a high probability of

participation. The procedure and method for predicting participation as well as the results of this estimation are explained in the next section.

Next, we identified students at schools *not* offering EAOP who had similar characteristics to those students who participated in EAOP at schools that offered it. Based on the characteristics that we found that predict participation in EAOP (step one above), we calculated an "out-of-sample" prediction of participation for each individual in the schools that do not offer EAOP. This means that based on the coefficients from the prediction model for the student characteristics (the independent variables in the prediction model, i.e., gender, ethnicity, etc.) we calculate a predicted value of participation in EAOP for the students who are in schools that do not offer EAOP.

As a result, students attending schools who do not offer EAOP have a calculated probability of participation in EAOP. This enabled us to identify students with both a high and a low probability of participation in EAOP at schools that do not offer EAOP. With this information, we could then compare the outcomes of students with a high probability of participation at schools that offer EAOP and the outcomes of students with a high probability of participation in schools that do not offer EAOP. This comparison of high probability students, in schools that offer EAOP and schools that do not offer EAOP, measures the impact of participation in EAOP accounting for any self-selection.

One concern remains however with using this comparison to measure the impact of participation. Other differences may exist that are not observed between the schools offering EAOP and those schools that do not offer EAOP. To address this issue, we further identified two groups: individuals with a low probability of participation in EAOP at schools offering it and students with a low probability of participation in EAOP at schools that do not offer it.

Identifying these two groups allows us to further compare the outcomes of students with a low probability of participation in schools that do offer EAOP and the outcomes of students with a low probability of participation in schools that do not offer EAOP. The observed difference in outcomes between the two low probability groups then serves as a control for the difference in outcomes across students in schools that offer EAOP and schools that do not offer it.

Therefore, to identify the program effect, we basically examine the difference in the differences between high probability individuals and low probability

individuals. (See Meyer, 1995, for a more detailed explanation of difference in differences methodology).

We generalize this technique and control for other differences between schools and students within a regression framework. We are able to control for the mean differences in outcomes of students at school that offer and do not offer EAOP, the probability of participating in EAOP for individuals at both groups of schools, and the probability of participating in EAOP at schools that offer EAOP. The regression equation is calculated using pooled data from the two groups of students: those at schools offering EAOP and those at schools not offering EAOP. This approach is comparable to having a natural experiment.

$$y_{it} = \alpha_0 + \alpha_1 d_t + \alpha_2 d_{it} + \beta d_t * d_{it} + \Sigma \delta_K z_{itK} + \varepsilon_{it} \qquad (1)$$

where the outcome y_{it} represents student I in school group t with a score 1 if that student is UC eligible and 0 otherwise, t is the dummy variable with the value 1 if the school is an EAOP school and 0 otherwise, d_{it} is the student's propensity score (or predicted probability of participating in the EAOP program for all students [as described above[i]]), z_{itK} is a vector of other explanatory variables, and ε_{it} is random error in y_{it}, with the ε_{it} assumed independent. j = 0 and 1, where j = 1 is the group of students at a school that offer EAOP and j = 0 is the group of students at schools that do not offer EAOP. The interaction term, $d_t * d_{it}$, takes the value of the probability of participation in EAOP when an individual attends a school that offers EAOP and takes on the value of 0 when an individual attends a school that does not offer EAOP. This interaction term indexes the difference between the relationship of d_{it} to UC eligibility in schools offering EAOP and schools not offering it, which is an indirect estimate of the difference in Equation 2. We also include, $\Sigma \delta_K z_{itK}$, which is an additional vector of explanatory variables as a simple way to adjust for observable differences between the individuals in the different groups. This controls for factors that simultaneously affect participation in EAOP and subsequent completion of UC college preparatory coursework.

Moreover, β is the effect of participation on the outcome. The key identifying assumption is that β would be 0 in the absence of participation in EAOP; that is, there would be no difference in the mean of those in group 0 and group 1. In this case, an unbiased estimate of β can be obtained by difference in differences as :

unbiased estimate of $\beta = \Delta\ \bar{Y}_0^1 - \Delta\ \bar{Y}_0^0$

$$= (\bar{Y}_1^1 - \bar{Y}_0^1) - (\bar{Y}_1^0 - \bar{Y}_0^0) \qquad (2)$$

where a bar indicates an average over I; the subscript denotes whether the individuals are in a school that offers EAOP; and the superscript denotes participation.

Again, β can be estimated directly by applying ordinary least squares, or in this case logistic regression, to Equation (1). This method reproduces the estimate of β, indicated in Equation (2). The advantage of the regression formulation is that it makes clear that the key identifying assumption is that there is no interaction between being in a school that offers EAOP and participating in EAOP (except for the influence under study). This approach, as explained above, therefore estimates the effect of participation in EAOP by correcting for the self-selection problem within a school and correcting for the mean differences among schools that offer and do not offer EAOP. This method is able to eliminate the most likely type of selection bias. We correct for the selection bias that is present when a student with a high probability of participating in EAOP chooses to participate. But we are not able to correct for the selection bias that could occur when a student with a high probability of participating in EAOP chooses to attend a high school *only* because the school offers EAOP.

Concerned about this potential bias, we investigated the background characteristics and traveling program choices of students in EAOP at EAOP schools and non-EAOP students at EAOP schools, as well as students at non-EAOP schools. Refer to Appendix A for these tables by students in EAOP at EAOP schools and non-EAOP students at EAOP schools as well as students at non-EAOP schools. We found that most students do not have their choice of high school because their high school is based on their resident location. We did not find any differences that would suggest that students who either voluntarily choose their high school or who attend their neighborhood high school are any more likely to be at an EAOP school; thus, suggesting that students are not choosing high schools based on the presence of the program. Additionally, we correct for all mean differences in schools, except for the fact that they offer EAOP. In the end, this method eliminates the largest sources of endogeneity.

Lastly, identification of participation in EAOP is possible through the variables that were included in the prediction equation that constructed d_{it}, but were excluded in the regression equations, Equation (1) that include d_{it} as an independent variable. The identifying variables for participation in EAOP are: Grade 9 GPA, ethnicity, and whether and with what grade (A, B, C, D, or F) a student completed both semesters of Algebra I (or its equivalent) by the end of ninth grade. We used these variables to identify participation in EAOP because generally students are selected to be part of the EAOP program if they are "showing promise" at the end of ninth grade. This generally means that a student has a GPA of a 3.0 or above at the end of ninth grade and has completed both semesters of Algebra I (or its equivalent) by the end of ninth grade. Students are selected based on a review of their transcripts at the very beginning of 10th grade. EAOP staff assess the courses taken and completed by the student as well as their overall ninth-grade GPA. They are looking for students that are essentially on-track to completing the A-G requirements at the end of ninth grade and show a level of academic performance that warrants completing the UC preparatory coursework. Generally a student on a traditional path would need to have completed Algebra I (or its equivalent) and English 9 by the end of ninth grade to be considered on track. Furthermore, ethnicity also is used to identify participation in EAOP. EAOP makes its program support available to all students who express interest. EAOP also works in schools that have not performed well historically and this correlates highly with schools having a large percentage of minority students. (See Table 1 for results).

Predicting Participation in EAOP at Schools That Offer It

In our pooled sample of 46,817 students, which includes both cohort years of data on ninth graders staring in 1996/'97 and 1995/'96, 7.0% of the individuals participated in EAOP. The 3,296 participants—the 7%—participated in a full 3 years of the EAOP program in high school during Grades 10, 11, and 12. In addition, 98% of the students who were selected to be in EAOP in ninth grade participate in the program for the full 3 years. Nearly three quarters (72.5%) of the study sample were enrolled at schools that offered EAOP to their students. In our study, out of 101 high schools, EAOP operated at 38; 20 of which have magnet programs at the high schools. Finally, the EAOP program does not necessarily operate every year at every high school, meaning that in some schools in some years, EAOP does not select students to participate in the EAOP program. However, if a student is selected into

EAOP and starts participating in the 10th grade, then they will be serviced by the EAOP program and participate in the program for their entire high school career.

Moreover, of those students in schools that offered EAOP, 9.7% participate in EAOP during their sophomore, junior, and senior year. Based on these individuals and their characteristics, we estimated a predictive regression equation for those individuals in schools that offered EAOP based on what factors we understand influence a student to participate in EAOP. As noted earlier, traditionally, students who have a grade point average above a 3.0 for their ninth grade year and have completed Algebra I or its equivalent by the end of ninth grade (i.e., in eighth or ninth grade) and English 9 by the end of ninth grade have a greater opportunity to participate in EAOP because EAOP aims to select students who have shown "potential" during ninth grade. Moreover, we hypothesize that students of different races, gender, language status, and economic background (operationalized by Title 1 status and whether a student qualifies to receive free and reduced lunch) make different choices about what programs to participate in during high school.

Table 1 below presents the results from the predictive regression of participation in EAOP for those students in schools that offer EAOP. The predicted value of participation in EAOP from this regression is calculated for each student in a school that offers EAOP. The regression yields the probability of participating in EAOP. Moreover, the coefficients reported in Table 1 were used (in the prediction equation described above) to predict participation in EAOP for those students who are at schools that do not offer EAOP. Refer to Appendix B for the means and standard deviations for all the variables in the prediction model for all students, students in EAOP schools, and students in non-EAOP schools.

In general, we found that students who participate in EAOP have the following individual characteristics: they are Hispanic and not white, Asian or Filipino; have high grade point averages in ninth grade, as well as in Grades 10–12; complete Algebra I (or its equivalent) by the end of ninth grade with an A, B or C grade; complete English 9 by the end of ninth grade with an A, B, or C grade; have non-limited English proficient status; and are not participating in the free/reduced lunch program. These findings suggest that participation in EAOP is dependent on ability, high school courses or programs, student's ethnicity and language abilities, as well as their familial economic status.

Table 1

Predictive Estimation of Participation in EAOP for Students in Schools That Offer EAOP

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
2	12852.163	.228	.482

B	B	S.E.	Wald	df	Sig.	Exp(B)
Grade 9 GPA	1.231	.067	342.288	1	.000	3.426
Grade 10-12 A-F GPA	1.391	.045	965.884	1	.000	4.020
Algebra 1			217.476	4	.000	
Left cohort	1.403	1.740	.650	1	.420	4.067
Complete 'D or F'	.158	.090	3.055	1	.080	1.171
Complete 'C'	.840	.068	152.426	1	.000	2.317
Complete 'A or B'	.792	.065	150.171	1	.000	2.207
English 9 (A or B)			91.798	3	.000	
Complete 'D or F'	.075	.151	.251	1	.617	1.078
Complete 'C'	.714	.110	42.143	1	.000	2.042
Complete 'A or B'	.806	.100	64.619	1	.000	2.240
Ethnicity			773.148	6	.000	
American Indian	.600	.359	2.796	1	.094	1.821
Asian	-2.315	.106	477.545	1	.000	.099
Black	-.114	.089	1.638	1	.201	.892
White	-1.822	.087	436.588	1	.000	.162
Filipino	-1.461	.125	136.956	1	.000	.232
Pacific-Islander	-.997	.434	5.287	1	.021	.369
Female	.015	.047	.100	1	.752	1.015
Non-LEP	.514	.083	38.430	1	.000	1.671
Free Lunch			106.759	2	.000	
Non-Part	-.617	.061	103.695	1	.000	.540
Missing	-.496	.148	11.311	1	.001	.609
Not Title 1	-.064	.053	1.453	1	.228	.938
Constant	-10.439	.217	2318.802	1	.000	.000

Note: Reference groups are Hispanic, Male, LEP, Free/Reduced Lunch, Receiving Title 1.

IV. Results

Our analyses provide information on the A-G completion of high school seniors. Most importantly, our results inform us about the impact of participation in EAOP on the outcome measure of A-G eligibility. Table 2 reports the outcome measure, A-G eligibility by EAOP status. Appendix A reports the background characteristics of students who participated and did not participate in EAOP in schools that offer EAOP as well as for students not in an EAOP school. Table 3 reports the simple logistic regression results of EAOP status on A-G eligibility status for only students in EAOP schools indicating the estimated likelihood of A-G completion for EAOP students compared to non-EAOP students in EAOP schools. Finally, Table 4 reports the logistic regression results for Equation (2) that include the estimated program effect, which is estimated using the interaction term (PRED*School Interaction). More general implications are discussed in the conclusion section.

Impact of Participating in EAOP

Basically, with a simple comparison we found that 40.0% of EAOP students are A-G eligible by the end of 12th grade, whereas only 9.5% of non-EAOP students are A-G eligible by the end of 12th grade (see Table 2). We also found by a simple logistic regression of EAOP on A-G eligibility, that EAOP students are twice as likely to achieve A-G eligibility by the end of 12th grade (see Table 3). These results motivate the further investigation of the impact of EAOP, but are not conclusive about the impact of EAOP for reasons of self-selection and endogeneity (as stated above). Thus to formally test the hypothesis that the academic development services offered by the University of California via EAOP result in more students completing the UC preparatory coursework, the first hurdle to being eligible for applying and being admitted to the University of California, we need to estimate Equation (2) as explained in the Empirical Framework section.

Table 2

Grade 9 Fall '95-'96 and '96-'97 Pooled Cohort (Students With 'Complete' Data) Final Eligibility and EAOP Status

	EAOP Status		
	Non-EAOP Student	EAOP Student	Total
Not A-F eligible			
Count	39404	1973	41377
% within column	90.5%	59.9%	88.4%
A-F eligible			
Count	4117	1323	5440
% within column	9.5%	40.1%	11.6%
Total			
Count	43521	3296	46817
% within column	100.0%	100.0%	100.0%

Table 3

Estimated Likelihood of A-G Eligibility for Students Who Participated in EAOP as Compared to Students Who Did Not Participate in EAOP in Schools That Offer EAOP

(*N* = 33,965)	Coefficient	Standard Error	Wald
EAOP	2.236	0.042	2800.291

Estimating Equation (2), as explained above, controls for self-selection and endogeneity. The results of this pooled estimation, found in Table 4, suggest that there is a definitive impact of EAOP participation on the A-G completion of high school seniors. The clearest method of interpreting this model is to investigate the coefficient of the interaction term. As shown in Table 4, the coefficient of the interaction term is a log odds of +0.763, which equals an odds ratio of 2.1447 ($e^{0.763}$ = 2.1447). Therefore, the model tells us that if a student is a participant in EAOP they are twice (2.14) as likely to complete the UC college preparatory coursework by the end of 12th grade than students who do not participate in EAOP.

Specifically, Table 4 reports the results of the pooled logistic regression that includes a school dummy variable (EAOP School), indicating whether the school offered EAOP, and a predicted participation variable (EAOP Prediction) for all students, regardless of whether the school offers EAOP were included to measure the comparability of the groups; and a school/participation interaction term

(PRED*School Interaction), indicating the probability of participating in EAOP for those individuals at schools that offer EAOP and 0 for those individuals not at a school that offers EAOP. Additional independent variables also were included to control for student and school factors that simultaneously affect participation and subsequent A-G completion. The overall fit of the model is judged by the Nagelkerke measure (or the Cox & Snell measure) (Kennedy, 1992). The corollary for these measures in ordinary least squares (OLS) regression is the *W* statistic. The goodness of fit that the Nagelkerke or Cox & Snell measure reflects is between two models examined in a Likelihood Ratio test and not between a model and observed data as is the case with linear regression. The value falls between 0 and 1 and tends to be much lower than the R2 statistic in linear regression analysis (Steinberg & Colla, 1991). A low number does not necessarily imply a poor fit, and values between 0.20 and 0.40 are considered very satisfactory. On this basis, our models appear satisfactory.

The interpretation of a positive coefficient on the school/participation interaction term (PRED*School Interaction) is that individuals who participate in EAOP during their high school years are more likely to complete the A-G course requirements by the end of 12th grade controlling for the choice of participation and the school differences related to offering EAOP. In addition, a negative coefficient indicates "less likely to complete." Moreover, the interpretation of the coefficient of the interaction term, which is a log odds of +0.763 and can be transformed into an odds ratio of 2.1447 ($e^{0.763} = 2.1447$), is that if a student is a participant in EAOP they are twice (2.14) as likely to complete the UC college preparatory coursework by the end of 12th grade than students who do not participate in EAOP.

To further investigate the program effect of EAOP, we replicated our analyses of modeling the prediction of EAOP and estimating the impact of EAOP with Equation (2) for each of the cohort years separately—1995/'96 and 1996/'97 cohorts. This yielded the same result. In both years the interaction term was significant at the .01 level and positive. The program effect was slightly stronger in 1995/'96: in 1995/'96, the analysis yielded a Wald of 8.46 on the interaction term with a Nagelkerke R Squared of .598, as compared to a Wald of 6.71 with a Nagelkerke R Squared of .628 in 1996/'97.

Furthermore, we decided to also replicate our analyses of predicting EAOP and Equation (2) using a restricted population. We selected out of the full population only students who had a 3.0 grade point average at the end of ninth grade and had

completed Algebra I or its equivalent with any grade by the end of ninth grade. This allowed us to investigate the effect of EAOP on students who have done very well in ninth grade and are considered on-track toward A-G completion at the end of ninth grade. This restriction reduced our pooled population down to 10,251 students as compared to the full population of 46,817. This also reduced our EAOP student group down to 2,273 as compared to the 3,296 in the full population. We conducted our pooled analyses as well as separate year analyses using the restricted population. The only difference in the modeling was that with the restricted population we had fewer categories on the Algebra I and English 9 completion variables. The restriction on the population eliminated three categories: "left the cohort," "did not complete Algebra I by end of ninth grade," and "did not complete English 9 by the end of Grade 9." Again, we found a positive and even stronger program effect for EAOP participation. The models for the pooled analysis using the restricted population yield a Wald of 20.92 on the interaction term with a Nagelkerke R Squared of .439.

In sum, we found in the pooled analysis, the separate cohort analysis for the full population, as well as these analyses for the restricted population that the coefficient for the interaction term was significant and positive. Specifically, the coefficient of the interaction term (a log odds of +0.763) equals an odds ratio of 2.1447 ($e^{0.763} = 2.1447$). The model tells us that students who participate in EAOP are twice (2.14) as likely to complete the UC college preparatory coursework by the end of 12th grade than students who do not participate in EAOP, indicating that EAOP has a large, positive effect on an individual's completion of UC coursework during high school.

Table 4

Estimated Impact of EAOP Participation on A-G Eligibility Controlling for Student Characteristics, Student Selection, and EAOP School Status

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
10	15863.999	.317	.615

B	B	S.E.	Wald	df	Sig.	Exp (B)
EAOP Prediction	-1.106	.182	37.012	1	.000	.331
EAOP School	-.548	.066	68.570	1	.000	.578
PRED*School Interaction	.763	.187	16.616	1	.000	2.145
A-F GPA (Grade 10-12)	2.930	.051	3273.251	1	.000	18.73
English 9			740.308	4	.000	
Left cohort	2.470	1.613	2.345	1	.126	11.821
Complete 'D or F'	-.264	.197	1.799	1	.180	.768
Complete 'C'	2.095	.121	300.057	1	.000	8.122
Complete 'A or B'	2.514	.115	481.971	1	.000	12.351
Female	-.310	.042	54.307	1	.000	.734
Non-LEP	.442	.087	26.017	1	.000	1.556
Free lunch			9.362	2	.009	
Non-part	.013	.052	.061	1	.805	1.013
Missing	-.405	.139	8.555	1	.003	.667
Not Title 1	.004	.055	.005	1	.942	1.004
1996-'97 cohort	.623	.042	224.479	1	.000	1.865
Constant	-12.314	.195	4003.918	1	.000	.000

Note: Reference groups are Hispanic, Male, LEP, Free/Reduced Lunch, and Receiving Title 1.

V. Conclusion

Overall, we found in a simple comparison that in schools that offer EAOP, more students who participated in EAOP completed the UC A-G preparatory course requirements by the end of 12th grade as compared to students who do not participate in EAOP. This simple comparison, however, did not take into account characteristics that are related to both choosing to participate in the EAOP program and to the outcome of interest. This is known as a self-selection problem. Controlling for self-selection, we find compelling evidence of higher completion of A-G courses by the end of 12th grade by participants of EAOP than by non-participants of EAOP. We find that students who participate in EAOP are twice (2.14) as likely to complete the UC college preparatory coursework by the end of 12th grade than students who

do not participate in EAOP. This suggests that there is a large, positive independent impact from participation in EAOP and that the observed effect is not driven by selection. Our results are compelling because we found the same results across pooled analyses and separate cohort analyses for the full population of students in the given district as well as across pooled analyses and separate cohort analyses for a restricted population of just those students who were on-track at the end of ninth grade. In sum, our results suggest that students who participate in EAOP throughout high school are twice as likely to complete the UC preparatory coursework by the end of 12th grade than are non-participants of EAOP.

References

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Appendix A:
Student Characteristics by Students in EAOP at EAOP Schools and Non-EAOP Students at EAOP Schools as Well as Students at Non-EAOP Schools

Table A.1

Grade 9 Fall 95-96 and 96-97 Pooled Cohort (Students With 'Complete' Data) Final Eligibility and EAOP School and Student Status

		EAOP School		
	Non-EAOP School	Non-EAOP Student	EAOP Student	Total
Not A-F eligible				
Count	10786	28618	1973	41377
% within column	83.9%	93.3%	59.9%	88.4%
A-F eligible				
Count	2066	2051	1323	5440
% within column	16.1%	6.7%	40.1%	11.6%
Total				
Count	12852	30669	3296	46817
% within column	100.0%	100.0%	100.0%	100.0%

Table A.2

Grade 9 Fall '95-'96 and '96-'97 Pooled Cohort (Students With 'Complete' Data) Algebra 1 by Ninth Grade Benchmark by EAOP Program Participation

		EAOP School		
	Non-EAOP School	Non-EAOP Student	EAOP Student	Total
Left District(s) in ninth				
Count	1	9	1	11
% within column	.0%	.0%	.0%	.0%
Incomplete or no courses				
Count	5428	16047	563	22038
% within column	42.2%	52.3%	17.1%	47.1%
Completed with < 'C'				
Count	2467	6620	227	9314
% within column	19.2%	21.6%	6.9%	19.9%
Completed with 'C'				
Count	2297	4208	767	7272
% within column	17.9%	13.7%	23.3%	15.5%
Completed with 'A or B'				
Count	2659	3785	1738	8182
% within column	20.7%	12.3%	52.7%	17.5%
Total				
Count	12852	30669	3296	46817
% within column	100.0%	100.0%	100.0%	100.0%

Table A.3

Grade 9 Fall '95-'96 and '96-'97 Pooled Cohort (Students with 'Complete' Data) English 9 by Ninth Grade Benchmark by EAOP Program Participation

		EAOP School		
	Non-EAOP School	Non-EAOP Student	EAOP Student	Total
Left District(s) in ninth				
Count	1	9	1	11
% within Column	.0%	.0%	.0%	.0%
Incomplete or no courses				
Count	1825	5784	229	7838
% within Column	14.2%	18.9%	6.9%	16.7%
Completed with < 'C'				
Count	3271	9703	93	13067
% within Column	25.5%	31.6%	2.8%	27.9%
Completed with 'C'				
Count	3271	9703	93	13067
% within Column	25.5%	31.6%	2.8%	27.9%
Completed with 'A or B'				
Count	4612	7531	2455	14598
% within Column	35.9%	24.6%	74.5%	31.2%
Total				
Count	12852	30669	3296	46817
% within Column	100.0%	100.0%	100.0%	100.0%

Table A.4

Grade 9 Fall '95-'96 and '96-'97 Pooled Cohort (Students with 'Complete' Data)

Ethnicity by EAOP Program Participation

		EAOP School		
	Non-EAOP School	Non-EAOP Student	EAOP Student	Total
American Indian				
Count	55	79	15	149
% within column	.4%	.3%	.5%	.3%
Asian				
Count	1404	1428	167	2999
% within column	10.9%	4.7%	5.1%	6.4%
Black				
Count	1280	3371	239	4890
% within column	10.0%	11.0%	7.3%	10.4%
Hispanic				
Count	6661	21622	2443	30726
% within column	51.8%	70.5%	74.1%	65.6%
White				
Count	3017	3204	305	6526
% within column	23.5%	10.4%	9.3%	13.9%
Filipino				
Count	393	843	119	1355
% within column	3.1%	2.7%	3.6%	2.9%
Pacific Islander				
Count	42	122	8	172
% within column	.3%	.4%	.2%	.4%
Total				
Count	12852	30669	3296	46817
% within column	100.0%	100.0%	100.0%	100.0%

Table A.5

Grade 9 Fall '95-'96 and '96-'97 Pooled Cohort (Students With 'Complete' Data) Gender by EAOP Program Participation

		EAOP School		
	Non-EAOP School	Non-EAOP Student	EAOP Student	Total
Male				
Count % within column	6334	15607	1233	23174
	49.3%	50.9%	37.4%	49.5%
Female				
Count % within column	6518	15062	2063	23643
	50.7%	49.1%	62.6%	50.5%
Total				
Count % within column	12852	30669	3296	46817
	100.0%	100.0%	100.0%	100.0%

Table A.6

Grade 9 Fall '95-'96 and '96-'97 Pooled Cohort (Students With 'Complete' Data) LEP Status Fall grade 10 by EAOP Program Participation

		EAOP School		
	Non-EAOP School	Non-EAOP Student	EAOP Student	Total
LEP	2365	8868	340	11573
Count % within column	18.4%	28.9%	10.3%	24.7%
Non-LEP	10487	21801	2956	35244
Count % within column	81.6%	71.1%	89.7%	75.3%
Total	12852	30669	3296	46817
Count % within column	100.0%	100.0%	100.0%	100.0%

Table A.7

Grade 9 Fall '95-'96 and '96-'97 Pooled Cohort (Students With 'Complete' Data) Meal Program Fall Grade 10 by EAOP Program Participation

		EAOP School		
	Non-EAOP School	Non-EAOP Student	EAOP Student	Total
Non-partic/Full pay				
Count % within column	6293 49.0%	9733 31.7%	794 24.1%	16820 35.9%
Free/Reduced				
Count % within column	6159 47.9%	19667 64.1%	2427 73.6%	28253 60.3%
Missing				
Count % within column	400 3.1%	1269 4.1%	75 2.3%	1744 3.7%
Total				
Count % within column	12852 100.0%	30669 100.0%	3296 100.0%	46817 100.0%

Table A.8

Grade 9 Fall '95-'96 and '96-'97 Pooled Cohort (Students With 'Complete' Data) Title 1 Fall Grade 10 by EAOP Program Participation

		EAOP School		
	Non-EAOP School	Non-EAOP Student	EAOP Student	Total
Not Title 1				
Count % within column	10585 82.4%	17579 57.3%	2180 66.1%	30344 64.8%
Title 1				
Count % within column	2267 17.6%	13090 42.7%	1116 33.9%	16473 35.2%
Total				
Count % within column	12852 100.0%	30669 100.0%	3296 100.0%	46817 100.0%

Table A.9

Grade 9 Fall '95-'96 and '96-'97 Pooled Cohort (Students With 'Complete' Data)
Travel Program Fall Grade 10 by EAOP Program Participation

		EAOP School		
	Non-EAOP School	Non-EAOP Student	EAOP Student	Total
Not in travel prog				
Count % within column	8888 69.2%	27142 88.5%	2684 81.4%	38714 82.7%
Involuntary				
Count % within column	838 6.5%	543 1.8%	33 1.0%	1414 3.0%
Voluntary				
Count % within column	3126 24.3%	2984 9.7%	579 17.6%	6689 14.3%
Total				
Count % within column	12852 100.0%	30669 100.0%	3296 100.0%	46817 100.0%

Table A.10
Grade 9 Fall '95-'96 and '96-'97 Pooled Cohort (Students With 'Complete' Data)
Mean GPA by Grade and EAOP Program Participation

		EAOP School		
	Non-EAOP School	Non-EAOP Student	EAOP Student	Total
Grade 9				
Mean	2.54	2.32	3.38	2.46
N	12791	30567	3294	46652
Grade 10-12 Weighted AP				
Mean	2.25	1.95	3.21	2.12
N	12733	30331	3296	46360

Appendix B:
Means & Standard Deviations for Variables Included in the 'Predictive Estimation of Participation in EAOP for Students in Schools That Offer EAOP' Presented in Table 1 for All Students, Students in EAOP Schools, and Students in Non-EAOP Schools

Table B.1
EAOP Variable Descriptives: All Students for the Pooled Data in Both EAOP and Non-EAOP Schools

Variable	*N*	Min.	Max.	Mean or %	SD
Grade 9 GPA	46652	0.0	4.0	2.457	0.841
Grade 10-12 A-F GPA	46360	0.0	4.9	2.123	0.934
Algebra 1					
Left cohort	46817	0.0	1.0	0.000	0.015
Did not complete	46817	0.0	1.0	0.471	0.499
Complete 'D or F'	46817	0.0	1.0	0.199	0.399
Complete 'C'	46817	0.0	1.0	0.155	0.362
Complete 'A or B'	46817	0.0	1.0	0.175	0.380
English 9 (A or B)					
Did not complete	46817	0.0	1.0	0.167	0.373
Complete 'D or F'	46817	0.0	1.0	0.279	0.449
Complete 'C'	46817	0.0	1.0	0.241	0.428
Complete 'A or B'	46817	0.0	1.0	0.312	0.463
Ethnicity					
American Indian	46817	0.0	1.0	0.003	0.056
Asian	46817	0.0	1.0	0.064	0.245
Black	46817	0.0	1.0	0.104	0.306
Hispanic	46817	0.0	1.0	0.656	0.475
White	46817	0.0	1.0	0.139	0.346
Filipino	46817	0.0	1.0	0.029	0.168
Pacific Islander	46817	0.0	1.0	0.004	0.061
Female	46817	0.0	1.0	0.505	0.500
Non-LEP	46817	0.0	1.0	0.753	0.431
Free Lunch					
Non-Part	46817	0.0	1.0	0.359	0.480
Missing	46817	0.0	1.0	0.037	0.189
Not Title 1	46817	0.0	1.0	0.648	0.478

Table B.2
EAOP Variable Descriptives: Pooled Data for Students in EAOP Schools Only

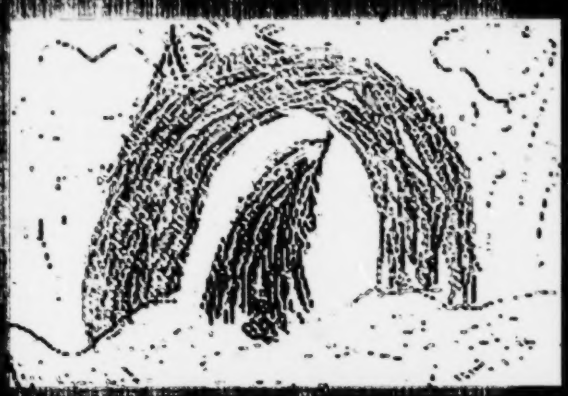
Variable	*N*	Min.	Max.	Mean or %	SD
Grade 9 GPA	33861	0.0	4.0	2.425	0.843
Grade 10-12 A-F GPA	33627	0.0	4.9	2.076	0.931
Algebra 1					
Left cohort	33965	0.0	1.0	0.000	0.017
Did not complete	33965	0.0	1.0	0.489	0.500
Complete 'D or F'	33965	0.0	1.0	0.202	0.401
Complete 'C'	33965	0.0	1.0	0.146	0.354
Complete 'A or B'	33965	0.0	1.0	0.163	0.369
English 9 (A or B)					
Did not complete	33965	0.0	1.0	0.177	0.382
Complete 'D or F'	33965	0.0	1.0	0.288	0.453
Complete 'C'	33965	0.0	1.0	0.240	0.427
Complete 'A or B'	33965	0.0	1.0	0.294	0.456
Ethnicity					
American Indian	33965	0.0	1.0	0.003	0.053
Asian	33965	0.0	1.0	0.047	0.212
Black	33965	0.0	1.0	0.106	0.308
Hispanic	33965	0.0	1.0	0.709	0.454
White	33965	0.0	1.0	0.103	0.304
Filipino	33965	0.0	1.0	0.028	0.166
Pacific Islander	33965	0.0	1.0	0.004	0.062
Female	33965	0.0	1.0	0.504	0.500
Non-LEP	33965	0.0	1.0	0.729	0.445
Free Lunch					
Non-Part	33965	0.0	1.0	0.310	0.462
Missing	33965	0.0	1.0	0.040	0.195
Not Title 1	33965	0.0	1.0	0.582	0.493

Table B.3
EAOP Variable Descriptives: Pooled Data for Students in Non-EAOP Schools Only

Variable	N	Min	Max.	Mean or %	SD
Grade 9 GPA	12791	0.0	4.0	2.539	0.833
Grade 10-12 A-F GPA	12733	0.0	4.7	2.250	0.931
Algebra 1					
Left cohort	12852	0.0	1.0	0.000	0.009
Did not complete	12852	0.0	1.0	0.422	0.494
Complete 'D or F'	12852	0.0	1.0	0.192	0.394
Complete 'C'	12852	0.0	1.0	0.179	0.383
Complete 'A or B'	12852	0.0	1.0	0.207	0.405
English 9 (A or B)					
Did not complete	12852	0.0	1.0	0.142	0.349
Complete 'D or F'	12852	0.0	1.0	0.255	0.436
Complete 'C'	12852	0.0	1.0	0.245	0.430
Complete 'A or B'	12852	0.0	1.0	0.359	0.480
Ethnicity					
American Indian	12852	0.0	1.0	0.004	0.065
Asian	12852	0.0	1.0	0.109	0.312
Black	12852	0.0	1.0	0.100	0.299
Hispanic	12852	0.0	1.0	0.518	0.500
White	12852	0.0	1.0	0.235	0.424
Filipino	12852	0.0	1.0	0.031	0.172
Pacific Islander	12852	0.0	1.0	0.003	0.057
Female	12852	0.0	1.0	0.507	0.500
Non-LEP	12852	0.0	1.0	0.816	0.388
Free Lunch					
Non-Part	12852	0.0	1.0	0.490	0.500
Missing	12852	0.0	1.0	0.031	0.174
Not Title 1	12852	0.0	1.0	0.824	0.381

Endnotes

[1] d_{it} is a constructed variable with a predicted value for participation in EAOP for those students in schools that offer EAOP and with the calculated out-of-sample predicted value for those students in schools that do not offer EAOP. The predicted value and the calculated out-of-sample predicted value are both based on the regression results in Table 1. In a natural experiment, d_{it} would be a dummy for participation in EAOP for both groups, but that is not possible in this case.



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